Nov. 21, 1944. W. O. JONES 2,363,334

SURGICAL NEEDLE HOLDER

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Fig. 1.

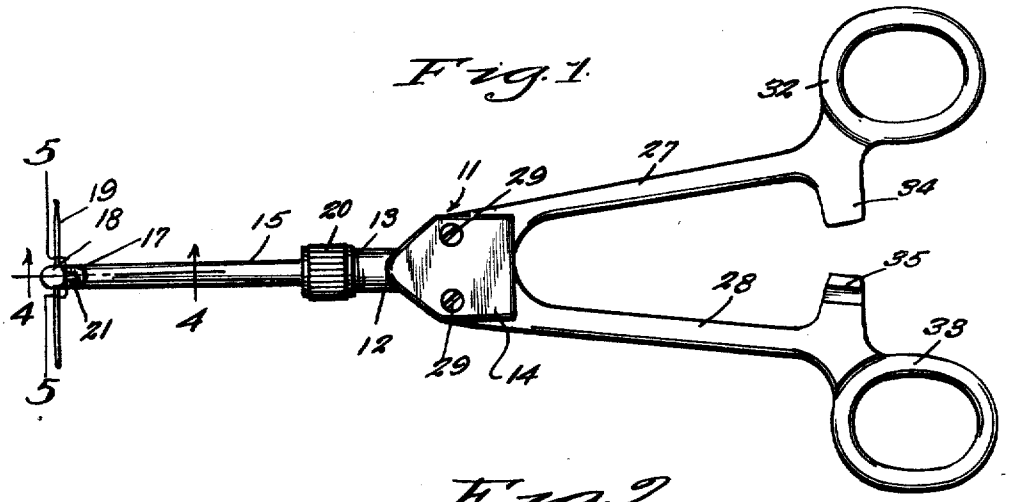


Fig. 2.

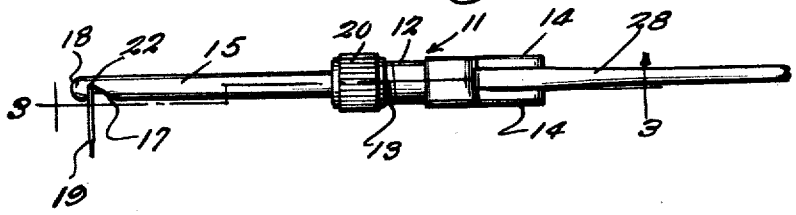


Fig. 3.

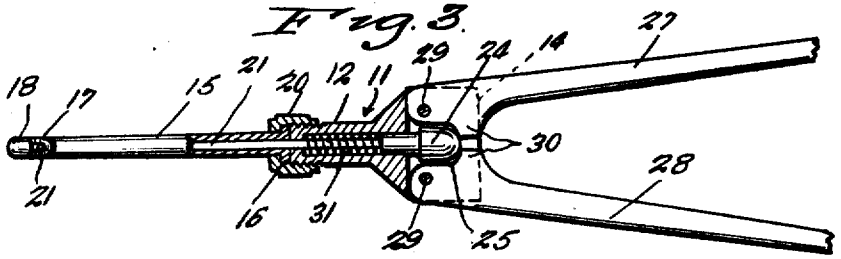
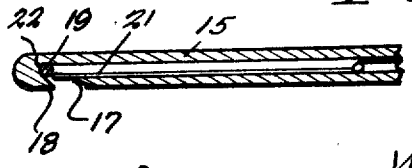


Fig. 4.



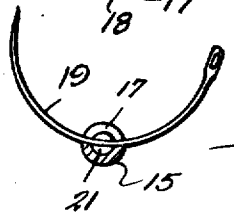


Fig. 5.

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Fig. 6.

Fig. 7.

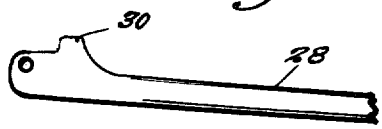


Fig. 8.

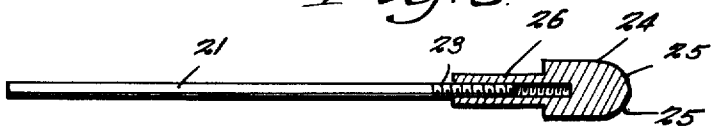


Fig. 9.

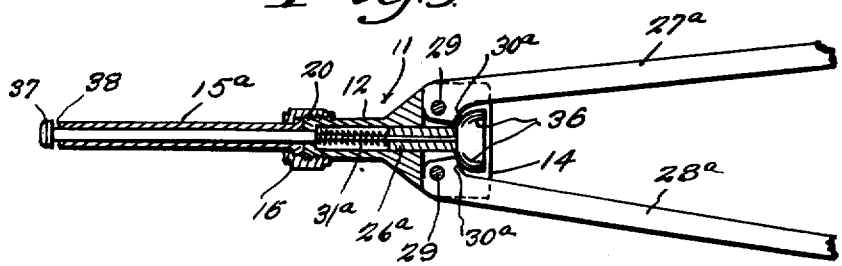
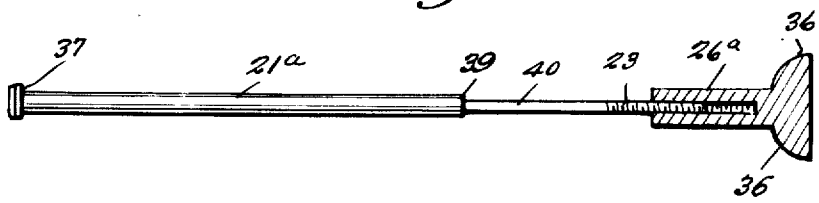


Fig. 10.



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SURGICAL NEEDLE HOLDER

William O. Jones, Baltimore, Md.

Application March 2, 1943, Serial No. 477,742

5 Claims. (Cl. 128—340)

The present invention relates to that category or classification of hospital supplies and accessories embodying forceps and equivalent holders for suture and surgical needles.

There are many different types of pincers-like forceps and similar holding tools on the market and in use by surgeons. However, the one most commonly seen and perhaps most used is an instrument made up of hinged levers with appropriate grips and retaining devices, the same having curvate superimposed jaws whose inner surfaces are formed with teeth or otherwise roughened to grasp the bight portion of the suture-needle therebetween. But the difficulty with this type of instrument and many others in use is that the needle has to be grasped so tightly as to cause it to fracture and break, or where it is not sufficiently gripped, it rocks bodily back and forth and gets out of position only to delay expert and skilful handling by the user.

My aim is, therefore, to generally improve upon surgical needle holders of types known to me and in fact to provide what is believed to be a somewhat different style and form which overcomes the aforementioned objection and which is outstanding in that it will positively hold the needle in such position as to expedite and facilitate manipulation thereof.

Another feature and advantage is predicated on the provision of a construction in which the parts are separable, whereby to provide for precision manufacturing but particularly to permit repair and replacement and frequent cleaning to render the same always in a reliable aseptic condition.

More specifically, the preferred embodiment of the invention is characterized by a body in which a spring-pressed retention rod or pin is slidably mounted, the pin coacting at its work-engaging end with a hook-like keeper or adapter, there being levers pivoted on the body and the coacting means between the levers and retention pin to promote a refined and delicate coaction susceptible of expedient operation, whereby to permit the levers to be manipulated readily while responding to the skillful hands of the surgeon.

Other features and advantages will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the same:

Figure 1 is what may be called a top plan view of a surgical needle holder constructed precisely in accordance with the predetermined principles of the present invention.

Figure 2 is a side elevation of the structure seen in Figure 1 with the finger grips omitted for clearness of illustration.

Figure 3 is a view partly in elevation and partly in section, the same being on the plane of the line 3—3 of Figure 2 and looking in the direction of the arrows.

Figure 4 is a fragmentary detail section on the plane of the line 4—4 of Figure 1.

Figure 5 is a cross section, that is, a view at right angles to the other section, this being on the line 5—5 of Figure 1.

Figure 6 is a perspective view of the flanged sheath.

Figure 7 is a fragmentary view of one end portion of one of the handles or levers.

Figure 8 is a view showing the inner end construction and removable thrust member on the so-called slidable retaining pin or rod.

Figure 9 is a view similar to Figure 3 showing a modified form or style of the invention.

Figure 10 is a view of the sleeve-like sheath and its associated plunger-like retaining pin or rod, this being the style shown in Figure 9.

In carrying into practice the ideas of the instant invention I found it expedient and practicable to adopt two different styles or forms wherein movement of the levers in a direction toward each other serves to exert an outward thrust upon the needle clamping or retaining pin, there being a similar arrangement in which the reverse is true. In the latter, the pivoted levers act to move the pin in a direction toward the user in a manner to be hereinafter more explicitly covered.

Attention is first invited to the form of the invention, the primary form, which is comprehensive in the illustrations Figures 1 to 8, inclusive.

The aforementioned body or casting is denoted by the numeral 11. This comprises the body proper whose converging median portion is fashioned into a stem-like socket 12 threaded as at 13. The opposite end portion of the body is formed with a kerf. Or it may be described as bifurcated, the furcations being denoted by the numerals 14. The sleeve-like sheath 15 is in the nature of a tube flanged at one end as at 16 (see Figure 6), the opposite end being provided with a beveled notch 17 and an adapter hook or keeper 18. These features 17 and 18 provide an ideal seat for the curved bight portion of the conventional surgical needle 19 as

is obvious from the drawings. The flanged end 16 of the sheath rests against the threaded end of the guide socket 12 where a knurled swivelled nut 20 serves to join and assemble the parts as brought out to advantage in Figure 3. The plunger-like unit comprises a rod or pin 21 (see Figure 8) which is mounted for reciprocation in the bore of the adapter sheath 15. The outer end thereof projects into the beveled seat region 17 and the extremity presses into the crotch 22 whereby to properly engage the needle. The opposite end of the slide-pin is threaded as at 23 to accommodate the fitting 24. This comprises a block-like part having curvate surfaces 25 functioning as cams. In addition it has a socketed extension 26 receiving the threaded portion 23 and joining the two parts 21 and 24 together to function as illustrated.

The handles or levers 27 and 28 are duplicates and the corresponding inner ends are hingedly or pivotally mounted as at 29 between the furcations 14. Adjacent the pivots 29 are specially formed portions 30 which function as thrusting cams and engage the cam surfaces 25. There is a spring 31 in the socket of the part 12, this spring surrounding the pin or rod 21 and bearing against the shoulder provided by the tubular extension on the fitting 24. The spring is normally expansible in a longitudinal direction to disengage the clamping end of the pin 21 from the hook 18 and crotch 22. In practice, the outer ends of the handles are provided with ring-like finger grips 32 and 33 having the usual coacting resilient detents 34 and 35. These parts 34 and 35 are brought into overlapping relation and engage and hold the handles together when the needle is in use. A slight lateral movement of the handles in relation to each other serves to quickly engage or disengage the detents 34 and 35.

Referring to Figures 1 to 8, singly and collectively it is quite evident that by simply grasping and pressing the levers 27 and 28 toward each other, they swing on their pivots 29 (see Figure 3) and bring the thrust cams 30 into engagement with the coacting cams 25. This serves to press the rod 21 in a direction outward in relation to the surrounding sleeve or sheath 15. With the bight portion of the needle in the seat or crotch 22 it is evident that the rod comes into firm engagement therewith and presses it home. At the same time the detents 34 and 35 engage and hold the levers in this position during the manipulation of the needle. Now, in case the needle needs to be shifted bodily, that is, in an axial path, this can be done by loosening the knurled nut 20. Then the sheath and needle therein can be swung either to the right or left depending on the angle of manipulation or the access to the incision.

The needle can be just as easily released as gripped. That is say, by simply "kicking" detents 34 and 35 apart in a well known manner, the levers swing apart and the spring 31 returns the retaining or retention pin 21 in an evident manner.

Now, while in the construction just described the bringing of the levers together forces the pin 15 against the anvil-like seat 22, it is sometimes advisable to slide the pin in an opposite direction, that is, in the direction toward rather than away from the user. This is brought out in the modification shown in Figures 9 and 10. The only difference here is in the outer end construction of certain parts and the inner end construction. All parts which are the same as already described will be referred to by the same numerals. That is to say, the body 11 has the socket-like threaded extension 12 to accommodate the knurled nut 20 which binds the flange-like end 16 in place, the flange being on the slightly different tube-like sheath 15a. In this form the levers 27a and 28a have their headed inner ends pivoted as at 29 between the furcations 14. It is to be noted, however, that here the shoulders 30a differ slightly. That is to say, they are designed and constructed to engage the cam surfaces 36 of the actuator. The actuator is provided with a socket 26a to accommodate the threads 23 on the slide rod or pin 21. In this instance, the pin is provided at its outer end with a circular head 37 of appropriate dimension engageable with the adjacent abutment or end 38 of the sleeve. This permits the bight portion of the needle to be engaged between the parts 37 and 38. Also, pushing the levers together exerts a movement against the cams 36 to slide the pin 22 in a direction toward the operator. So, in this instance, the spring 31a exerts a stress on the shoulder 39 and surrounds the reduced portion 40. This, therefore, pushes the head 37 outwardly beyond the accommodation tube 15a to normally disengage or separate the parts 37 and 38. In principle, however, both forms of the invention are approximately the same and the claims are, therefore, so worded.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Minor changes in shape, size, and rearrangement of details coming within the field of invention claimed may be resorted to in actual practice, if desired.

Having described the invention, what is claimed as new is:

1. As a component part of a surgical needle holder of the class described, a body including spaced parallel furcations and a socketed extension, said extension having a guide passage in alignment with the socket and being externally screw-threaded to accommodate an assembling nut, a pair of levers having corresponding inner ends pivotally mounted between said furcations, the pivoted ends of the levers being provided with thrust shoulders, a sheath-like tube to accommodate a companion reciprocatory needle engaging and retaining pin, said tube being provided at its outer end with surgical needle accommodation means, the inner end being provided with a flange, said flange resting in abutting relation with said extension on said body, and a nut embracing the sheath and flange and threadedly engaged with the extension, whereby to provide a separable connection between the extension and sheath.

2. A needle holder of the class described comprising a body including spaced parallel furcations and an extension having a guide opening and a socket in alignment with said guide opening, a reciprocatory needle engaging and retaining pin slidable through said guide opening and socket and provided at its inner end with cam equipped actuating means, a sheath-like member removably mounted on said extension, said pin being mounted for reciprocation in said sheath-like member, and levers pivoted between the furcations and having elements engaging the

cams in the manner and for the purposes described.

3. As a component part of a surgical needle holder of the class described, a body having spaced parallel furcations and a relatively reduced extension, said extension being tubular in cross-sectional form and being externally screw-threaded to accommodate an assembling nut, and a pair of levers having their corresponding inner ends removably and pivotally mounted between said furcations, said pivoted ends of the levers being provided with thrust shoulders.

4. As a component part of a surgical needle holder of the type shown and described, a body having spaced furcations at one end and a tubular guide extension at the opposite end, said guide extension being externally screw-threaded, a pair of levers having corresponding inner ends pivotally mounted between said furcations, a sheath-like tube provided at its inner end with a flange abutting said tubular extension, and a nut embracing the sheath and flange and threadedly connected with the screw-threads on the adjacent end of said extension, the outer end of said tube being closed and provided inwardly of said closed end with a lateral needle accommodation notch, the flanged nut connection of the inner end of the tube of the extension being such as to permit the tube to be axially turned to shift the position of the notch to vary its angularity in relation to the furcations and levers, in the manner and for the purposes described.

5. As a new article of manufacture and a component part of a surgical needle holder of the class described, an elongated tubular sleeve constituting a plunger-pin accommodation sheath, said sleeve being open at its inner end and provided at said end with an outstanding annular flange for assembling and retention purposes, the opposite end being closed and provided in one side with a lateral notch, said notch being spaced inwardly of said closed end and defining a needle seating crotch, one wall of said notch being beveled in relation to the crotch to facilitate insertion and removal of the needle to be held, said closed end being fashioned to provide a hook, the bill of the hook being in longitudinal alignment with the axis of the sleeve and overhanging said crotch to facilitate maintaining the needle against accidental displacement.

WILLIAM O. JONES.